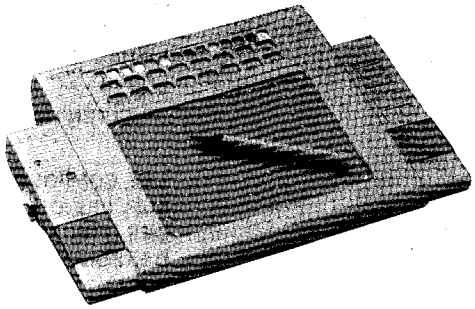
XV-T33

SERVICE MANUAL

US Model
REVISED
Canadian Model



Discard your XV-T33 Service Manual for US Model (9-973-217-11) previously issued. This Service Manual contains it.

Edit Studio

SPECIFICATIONS

Connectors

Video input	Phono jack (1) Input signal: 1 Vp-p, 75 ohms unbalanced, sync negative
S video input	4-pin mini DIN connector (1) Luminance signal: 1 Vp-p, 75 ohms unbalanced, sync negative Chrominance signal: 0.286 Vp-p, 75 ohms unbalanced
Video output	Phono jack (1) Output signal: 1 Vp-p, 75 ohms unbalanced, sync negative
S video output	4-pin mini DIN connector (1) Luminance signal: 1 Vp-p, 75 ohms unbalanced, sync negative Chrominance signal: 0.286 Vp-p, 75 ohms unbalanced

General

Power requirements	120 V AC, 60 Hz
Power consumption	10 W
Operating temperature	0°C to 40°C (32°F to 104°F)
Operating humidity	20 % to 80 %
Dimensions	Approx. 360 × 73 × 257 mm (w/h/d) (14 1/4 × 2 7/8 × 10 1/8 inches)
Weight	Approx. 1.7 kg (3 lb 12 oz)
Supplied accessories	Video connecting cable (2) Drawing pen (1) Quick Reference Card (1) Operating Instructions (1)

Design and specifications are subject to change without notice.

MICROFILM

Video Sketch Titler

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

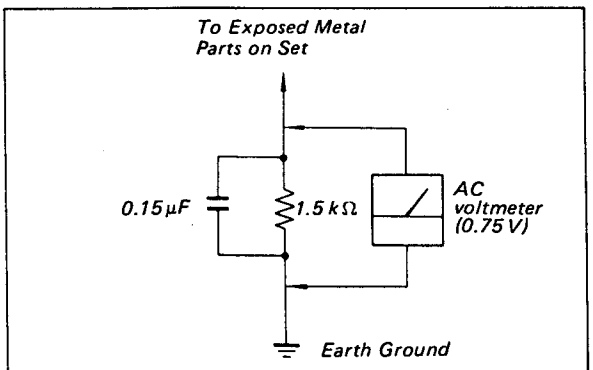


Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

TABLE OF CONTENTS

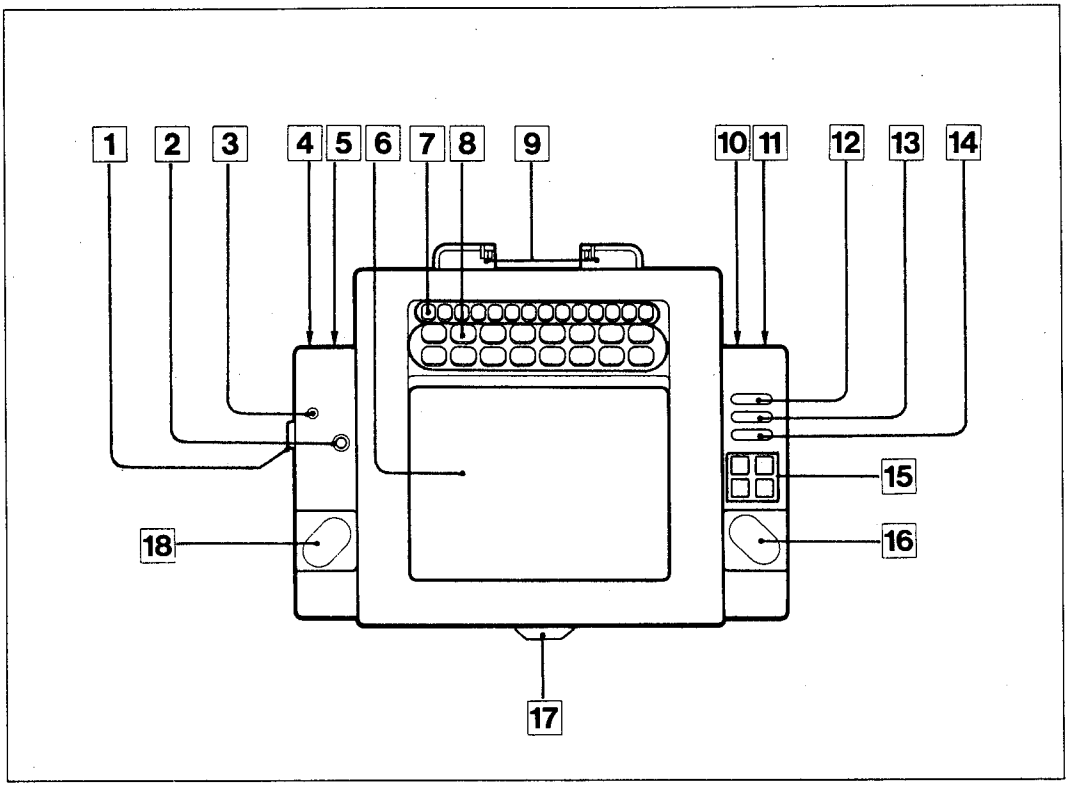
Section	Title	Page
1.	GENERAL	
	Identifying the Parts	3
	Connecting Video Equipment	5
2.	DISASSEMBLY	6
3.	DIAGRAMS	
3-1.	Circuit Boards Location	7
3-2.	Digital Processing Section Block Diagram	9
3-3.	Analog Processing Section Block Diagram	11
4.	PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS	
	PU-51, SW-48, SW-55, EX-26, CN-54, CN-55 Boards	14
	EN-5 Board	22
5.	EXPLODED VIEW	27
6.	ELECTRICAL PARTS LIST	28
7.	OPERATING PRINCIPLE DESCRIPTION	36
8.	ELECTRICAL ADJUSTMENTS	
8-1.	SG Clock Adjustment	39
8-2.	AFC Frequency Adjustment	39
8-3.	VDP (Video Display Processor) Adjustment	39
8-4.	AFC H Position Adjustment	40
8-5.	BLK Position Adjustment	40
8-6.	V Reset Adjustment	40
8-7.	Video Output Level Adjustment	41
8-8.	APC (Automatic Phase Control) Adjustment	41
8-9.	S Video Level Adjustment	41
8-9-1.	Y Level Adjustment	41
8-9-2.	Chroma Level Adjustment	41
8-10.	Adjusting Parts Location	42

This section is extracted from instruction manual.

SECTION 1
GENERAL

Identifying the Parts

Familiarize yourself with the parts of the titler before you start the operations.



1 Power switch
Switch on to turn on the power.

2 CLEAR button
Press to clear the screen.

3 POWER indicator
Lights up when the power goes on.

4 S VIDEO input jack
Use this jack to connect to the S video output jack of the player.

5 VIDEO input jack
Use this jack to connect to the video output jack of the player.

6 Pad
Use this pad to draw titles on using the supplied pen.

7 Color select keys
Select the color of the title. ◎ chooses the rainbow color (see "Rainbow Colors" on page 36). (T) chooses transparent.

8 Drawing keys
Select various ways to create a title. See "Function of the Drawing Keys" on page 9 for details.

9 Pen holder
Lay the supplied pen on this holder.

10 S VIDEO output jack
Use this jack to connect to the S video input jack of the recorder.

Identifying the Parts

11 VIDEO output jack
Use this jack to connect to the video input jack of the recorder.

12 SUPERIMPOSE button and indicator
You can superimpose titles on the video picture when the indicator lights up. Each time you press this button, the indicator lights up and goes out alternately.

Indicator	What you see on the screen
On	The title on the video picture
Off	The title only

13 1 PAGE 2 button and indicators
The video sketch titler has two screens to create and scroll titles with. These screens are called PAGE 1 and PAGE 2. Select the screen you want to work on. Each time you press this button, the indicators of PAGE 1 and PAGE 2 light up alternately.

Indicator	You are working on
PAGE 1 is on	The title on page 1
PAGE 2 is on	The title on page 2

14 DRAW STANDBY button and indicators
Select the mode for creating and scrolling the titles.
Each time you press this button, the DRAW and STANDBY indicators light up alternately.

Indicator	You are
DRAW is on	Creating the title
STANDBY is on	Ready to scroll the title

15 WIPE PATTERN buttons and indicators
Select how to scroll the title.
When you press the button, the indicator lights up.
The following table shows the function of each button.

Button	How the title scrolls
	Appears and disappears instantly
	Scrolls from the bottom upwards
	Scrolls from the top downwards
	Appears from the center and scrolls outwards or disappears as it goes from the title edge to the center

16 DRAW/WIPE OUT button
Press when creating the title. Also, press to make the title disappear.

17 Quick reference card
Use the card to conveniently refer to the use of the titler.

18 DRAW/WIPE IN button
Press when creating a title. Also, press to scroll in the title.

Function of the Drawing Keys

The following table shows the function of the drawing keys.

Drawing key	Function	Reference page
	Draw a square.	25
	Draw a circle.	25
	Draw a caption.	25
	Draw a wooden board.	25
	Draw a wooden line.	25
	Select a letter.	15, 23
	Select a sample title and illustration.	24
	Erase a title and illustration.	29
	Draw a thin curved line.	24
	Draw a thick curved line.	24
	Draw an outlined curved line.	24
	Draw a checkered curved line.	24
	Draw an outlined straight line.	25
	Paint a title and illustration.	27
	Copy a title and illustration.	28
	Undo a previous action.	29

Connecting Video Equipment

Connect the titler to video equipment before you start using the titler. This section explains two ways to connect video equipment, basic connection and connection using the S video jacks.

Video Equipment Used with the Titler

When using the titler, you need the following video equipment for connection:

- a TV or a monitor for creating titles and viewing the video picture
- a VCR or a video camera recorder for playing the original videotapes (player)
- a VCR for recording the titles and original tapes combined (recorder)

Note on Connection

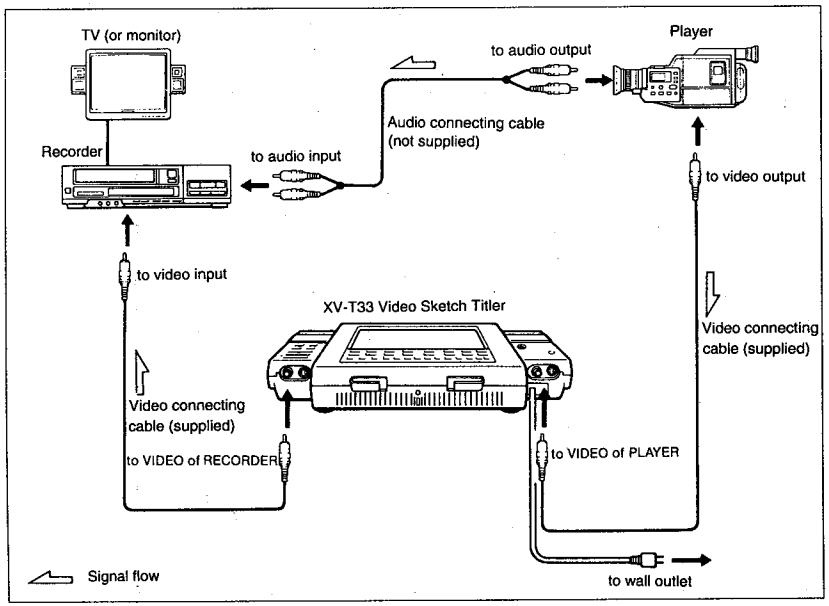
Be sure to turn off the power of the titler and video equipment before connection.

About the player and the recorder

- Connect the red plug to the audio right jack (red) and the white plug to the audio left jack (white).
- Connect the yellow plug to the video jack (yellow).
- When the player or the recorder is a monaural type, use a monaural A/V connecting cable such as VMC-910MS/920MS (phono plug X 2 - phono plug X 3) (not supplied).
- When both the player and the recorder have the S video jacks, we recommend you to use the S video jacks with optional cables such as YC-15V/30V/15EV/30EV.

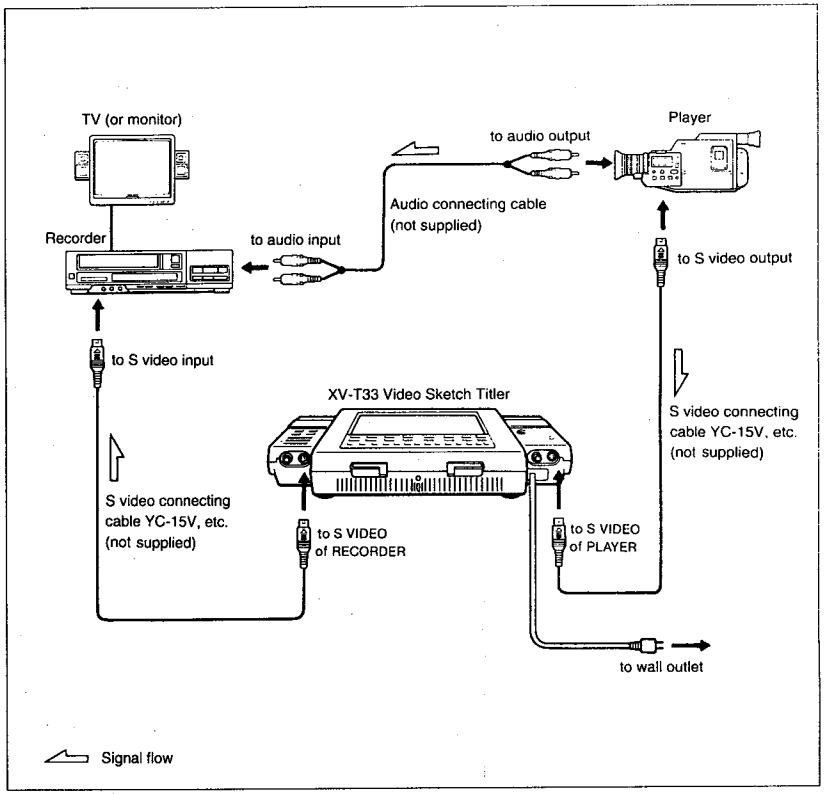
Basic Connection

The following illustration shows the connection of the titler with the video equipment.



Connection Using the S Video Jacks

The following illustration shows the connection of the titler with video equipment that has the S video jacks.

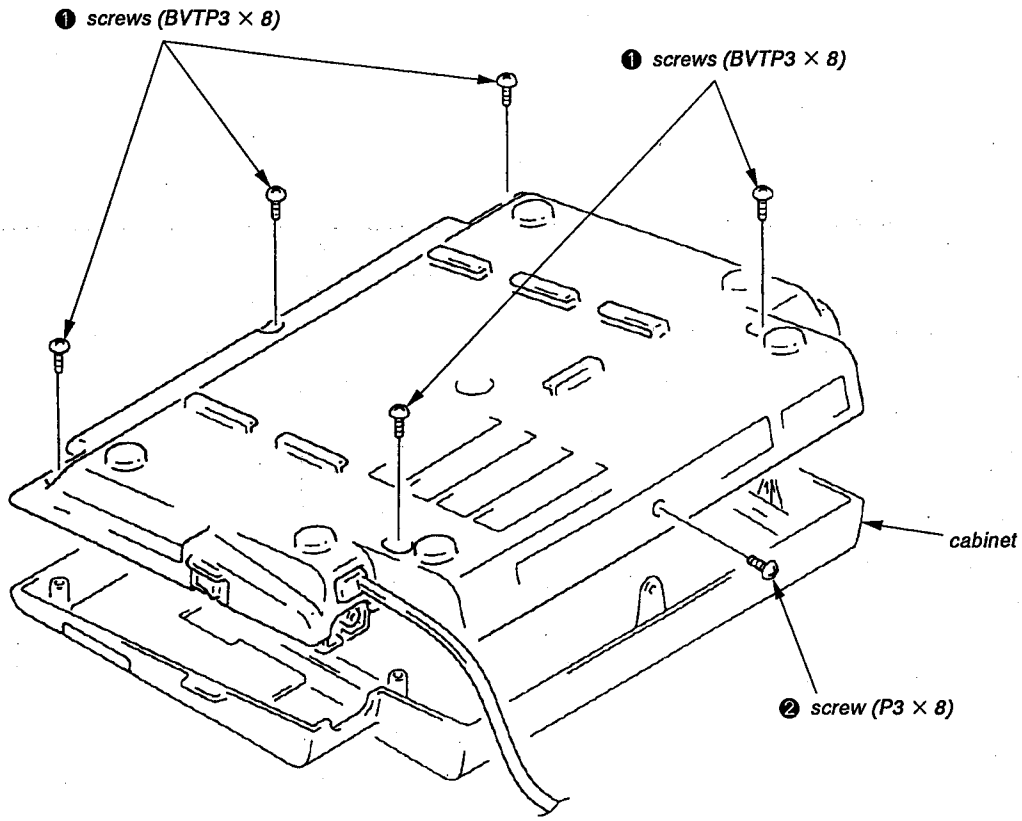


When using the S video jacks

When you use either the video input jack or the S video input jack to input the signal from the player, the signal is output from both the video output jack and the S video output jack. But to get a clearer picture from the player, we recommend you to use the S video jacks of the player and the recorder when using the S video jacks of the titler, or use the video jacks of the player and the recorder when using the video jacks of the titler.

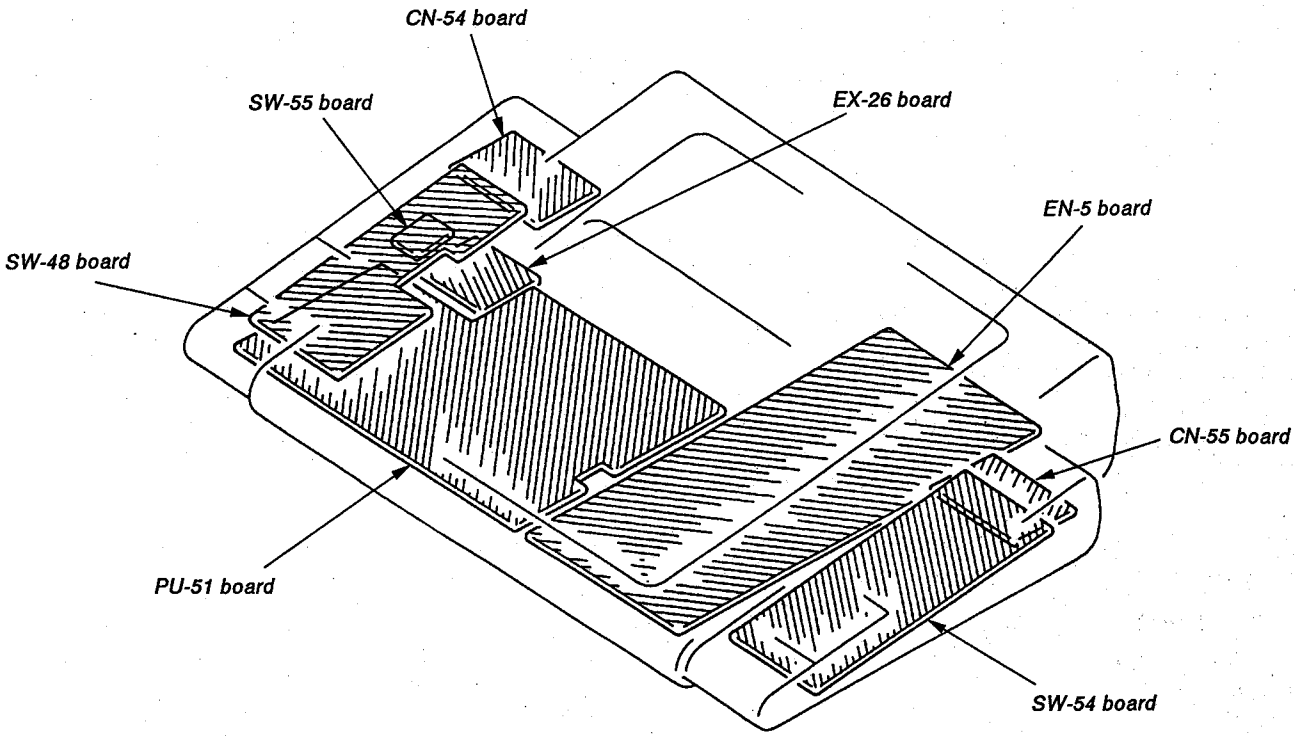
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.



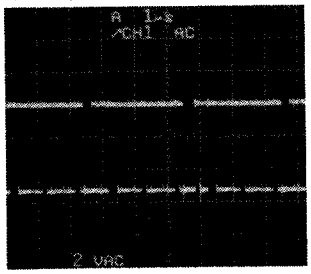
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

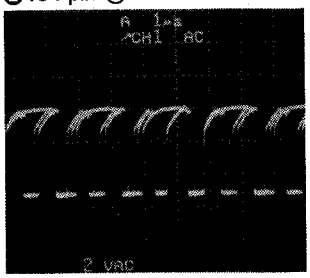


• Waveforms (PU-51 Board)

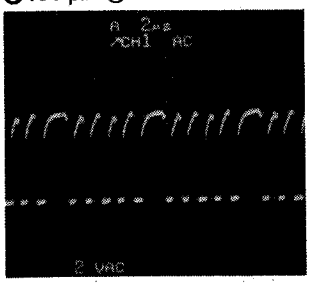
❶ IC4 pin ㉒



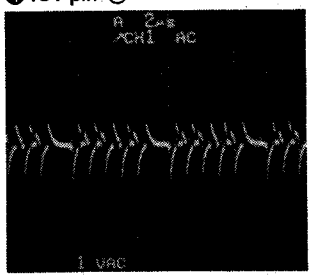
❷ IC4 pin ㉔



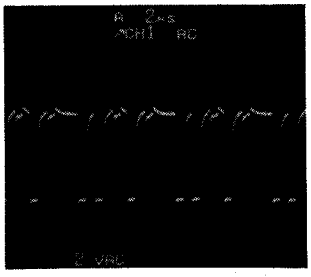
❸ IC1 pin ㉑



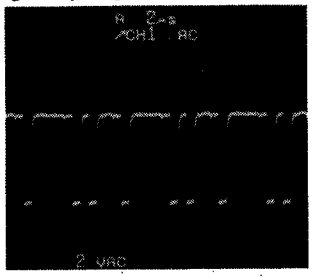
❹ IC1 pin ㉒



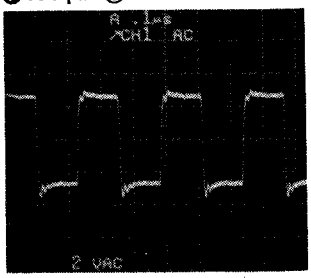
❺ IC1 pin ㉗



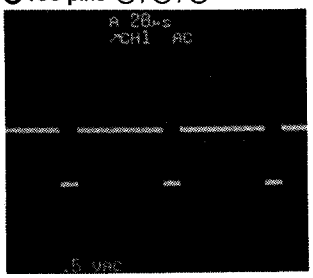
❻ IC1 pin ㉘



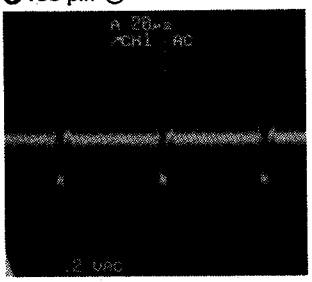
❼ IC1 pin ⑥



❽ IC8 pins ㉒, ㉓, ㉔



❾ IC8 pin ⑩



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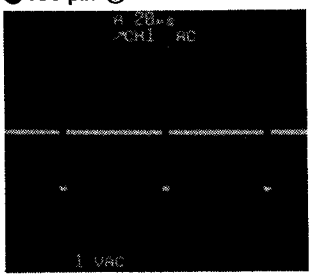
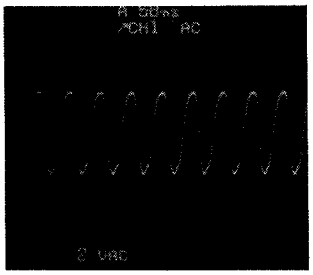
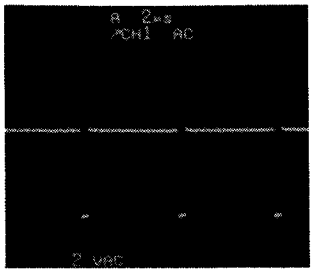


⓫ IC8 pin ㊸



⓬ IC6 pin ①



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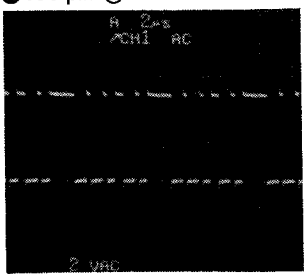
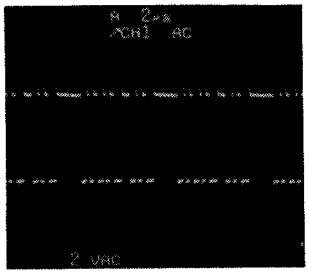
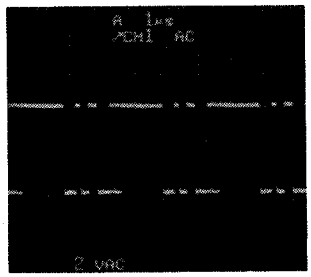


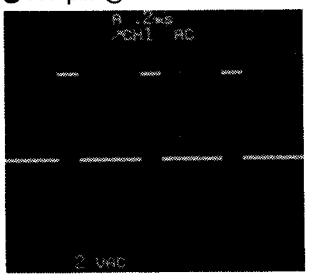
⓮ IC6 pin ⑮



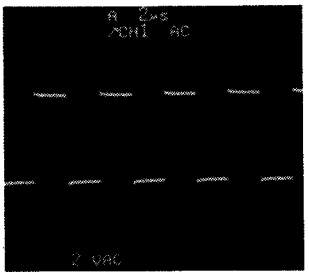
⓯ IC7 pin ㉞



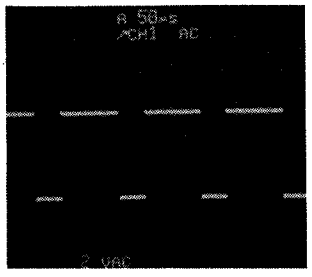
⓰ IC7 pin ㉝



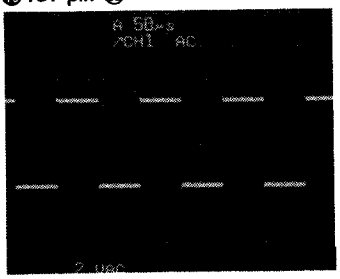
⓱ IC7 pin ㉛



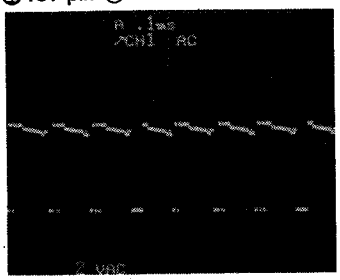
⓲ IC7 pin ㉜



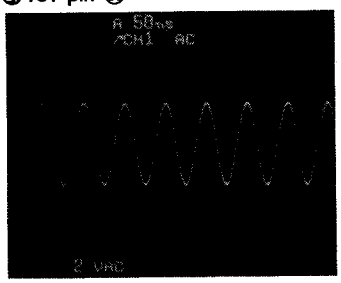
⓳ IC7 pin ㊽



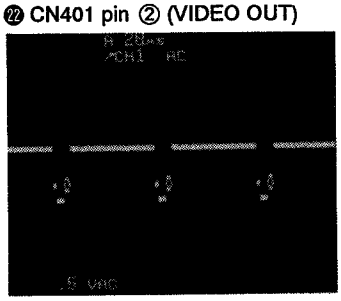
⓴ IC7 pin ㊾



㉑ IC7 pin ㊶



㉒ CN401 pin ② (VIDEO OUT)



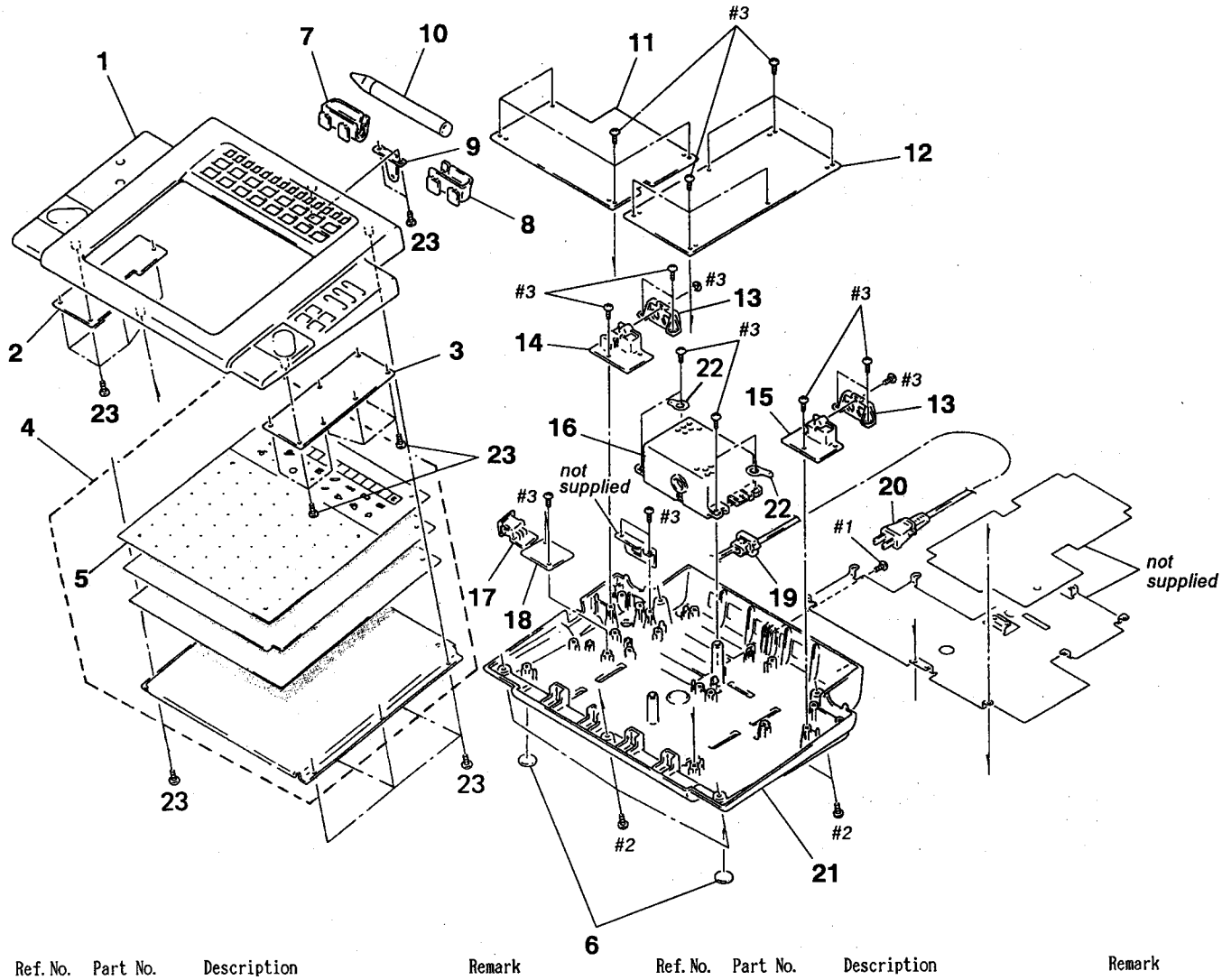
SECTION 5
EXPLODED VIEW

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1)



Ref. No.	Part No.	Description	Remark
1	X-4620-174-1	CASE (UPPER) ASSY	
* 2	A-8080-684-A	SW-48 BOARD, COMPLETE	
* 3	A-8080-683-A	SW-54 BOARD, COMPLETE	
4	A-8042-110-A	TABLET ASSY	
5	4-622-095-01	SHEET	
6	4-620-790-01	FOOT	
7	4-620-597-11	HOLDER (L), PEN	
8	4-620-596-11	HOLDER (R), PEN	
* 9	4-620-586-01	STOPPER	
10	X-4620-176-1	PEN ASSY	
* 11	A-8080-685-A	PU-51 BOARD, COMPLETE	
* 12	A-8080-690-A	EN-5 BOARD, COMPLETE	
13	4-620-591-11	BRACKET, JACK	
* 14	A-8080-688-A	CN-54 BOARD, COMPLETE	
* 15	A-8080-689-A	CN-55 BOARD, COMPLETE	
⚠16	1-413-660-11	REGULATOR, SWITCHING	
* 17	1-636-914-11	SW-55 BOARD	
* 18	1-636-624-12	EX-26 BOARD	
⚠19	*3-703-244-00	BUSHING (2104), CORD	
⚠20	1-575-105-11	CORD, POWER	
* 21	4-620-602-11	CASE (LOWER)	
22	4-621-926-01	CLAMP	
23	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	

CN-54 CN-55 EN-5

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

When including parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
*	A-8080-688-A	CN-54 BOARD, COMPLETE			
		**********			
*	1-636-627-12	CN-54 BOARD			
		< CONNECTOR >			
CN301	1-580-319-11	JACK, PIN 2P (PLAYER)			
		< LINE FILTER COIL >			
LF301	1-424-102-11	COIL, LINE FILTER			
LF302	1-424-102-11	COIL, LINE FILTER			
LF303	1-424-102-11	COIL, LINE FILTER			
**********					
*	A-8080-689-A	CN-55 BOARD, COMPLETE			
		**********			
*	1-636-628-12	CN-55 BOARD			
		< CONNECTOR >			
CN401	1-580-320-11	JACK, PIN 2P (RECORDER)			
* CN402	1-564-521-11	PLUG, CONNECTOR 6P			
		< LINE FILTER COIL >			
LF401	1-424-102-11	COIL, LINE FILTER			
LF402	1-424-102-11	COIL, LINE FILTER			
LF403	1-424-102-11	COIL, LINE FILTER			
**********					
*	A-8080-690-A	EN-5 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C301	1-124-234-00	ELECT	22uF	20%	16V
C302	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C305	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C306	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C309	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C310	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C311	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C312	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C315	1-126-101-11	ELECT	100uF	20%	16V
C316	1-126-101-11	ELECT	100uF	20%	16V
C317	1-126-101-11	ELECT	100uF	20%	16V
C318	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C323	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C324	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C325	1-130-491-00	MYLAR	0.047uF	5%	50V
C326	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C327	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C328	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C329	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C330	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C331	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C332	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C333	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C334	1-126-157-11	ELECT	10uF	20%	16V
C335	1-124-234-00	ELECT	22uF	20%	16V
C336	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C337	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C338	1-126-103-11	ELECT	470uF	20%	16V
C339	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C340	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C341	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C342	1-130-495-00	MYLAR	0.1uF	5%	50V
C343	1-124-234-00	ELECT	22uF	20%	16V
C344	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C345	1-130-483-00	MYLAR	0.01uF	5%	50V
C346	1-130-487-00	MYLAR	0.022uF	5%	50V
C347	1-130-479-00	MYLAR	0.0047uF	5%	50V
C348	1-130-475-00	MYLAR	0.0022uF	5%	50V
C349	1-130-477-00	MYLAR	0.0033uF	5%	50V
C350	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C351	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C352	1-130-479-00	MYLAR	0.0047uF	5%	50V
C353	1-130-479-00	MYLAR	0.0047uF	5%	50V
C354	1-126-157-11	ELECT	10uF	20%	16V
C355	1-130-495-00	MYLAR	0.1uF	5%	50V
C356	1-124-234-00	ELECT	22uF	20%	16V
C357	1-163-038-00	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
C358	1-130-483-00	MYLAR	0.01uF	5%	50V
C359	1-130-492-11	MYLAR	0.056uF	5%	50V
C360	1-126-157-11	ELECT	10uF	20%	16V
C361	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C362	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C363	1-126-157-11	ELECT	10uF	20%	16V
C364	1-126-157-11	ELECT	10uF	20%	16V
C365	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C366	1-126-157-11	ELECT	10uF	20%	16V
C367	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C368	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C369	1-126-157-11	ELECT	10uF	20%	16V
C370	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C371	1-126-157-11	ELECT	10uF	20%	16V
C372	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C373	1-124-234-00	ELECT	22uF	20%	16V
C374	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C375	1-130-475-00	MYLAR	0.0022uF	5%	50V
C376	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C377	1-130-475-00	MYLAR	0.0022uF	5%	50V
C380	1-130-475-00	MYLAR	0.0022uF	5%	50V
C381	1-130-488-00	MYLAR	0.027uF	5%	50V
C382	1-130-483-00	MYLAR	0.01uF	5%	50V
C383	1-130-482-00	MYLAR	0.0082uF	5%	50V
C384	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C385	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C386	1-130-475-00	MYLAR	0.0022uF	5%	50V
C387	1-130-475-00	MYLAR	0.0022uF	5%	50V
C388	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C389	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C390	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C391	1-130-483-00	MYLAR	0.01uF	5%	50V
C392	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C393	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C394	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C395	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C396	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C397	1-130-475-00	MYLAR	0.0022uF	5%	50V
C398	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C399	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C400	1-126-103-11	ELECT	470uF	20%	16V
C402	1-124-234-00	ELECT	22uF	20%	16V
C404	1-126-103-11	ELECT	470uF	20%	16V
C406	1-126-103-11	ELECT	470uF	20%	16V
C407	1-126-103-11	ELECT	470uF	20%	16V
C409	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C411	1-126-103-11	ELECT	470uF	20%	16V
C412	1-124-477-11	ELECT	47uF	20%	25V

Ref. No.	Part No.	Description			Remark
C414	1-126-103-11	ELECT	470uF	20%	16V
C415	1-124-477-11	ELECT	47uF	20%	25V
C416	1-126-157-11	ELECT	10uF	20%	16V
C417	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C418	1-126-157-11	ELECT	10uF	20%	16V
C419	1-126-103-11	ELECT	470uF	20%	16V
C420	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C421	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C422	1-124-477-11	ELECT	47uF	20%	25V
C423	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C425	1-163-237-11	CERAMIC CHIP	27PF	5%	50V

< CONNECTOR >

* CN301	1-564-509-11	PLUG, CONNECTOR 6P	
* CN302	1-564-505-11	PLUG, CONNECTOR 2P	
* CN303	1-564-712-11	PIN, CONNECTOR (SMALL TYPE)	10P
* CN304	1-564-712-11	PIN, CONNECTOR (SMALL TYPE)	10P
* CN305	1-564-509-11	PLUG, CONNECTOR 6P	

< TRIMMER >

CV301	1-141-245-00	CAP, TRIMMER 30PF	
CV303	1-141-320-11	CAP, VAR, TRIMMER	

< DIODE >

D302	8-719-105-74	DIODE	RD4.7M-B3
D303	8-719-800-76	DIODE	1SS226
D304	8-719-800-76	DIODE	1SS226
D306	8-719-992-07	DIODE	1SS144
D307	8-719-800-76	DIODE	1SS226
D308	8-719-800-76	DIODE	1SS226
D309	8-719-800-76	DIODE	1SS226
D310	8-719-800-76	DIODE	1SS226
D311	8-719-800-76	DIODE	1SS226
D312	8-719-800-76	DIODE	1SS226

< FERRITE BEADS >

FB701	1-412-390-21	FERRITE BEADS BLM21A05

< FILTER >

FL301	1-236-058-11	ENCAPSULATED COMPONENT
FL302	1-239-035-21	LINE FILTER
FL303	1-239-035-21	LINE FILTER
FL304	1-239-035-21	LINE FILTER
FL305	1-239-035-21	LINE FILTER
FL306	1-239-035-21	LINE FILTER
FL307	1-239-035-21	LINE FILTER

Ref. No.	Part No.	Description		Remark
		< IC >		
IC301	8-752-321-16	IC	CXD1030M	
IC302	8-759-011-65	IC	MC74HC4053F	
IC303	8-759-011-65	IC	MC74HC4053F	
IC304	8-759-914-57	IC	BA7230LS	
IC305	8-759-100-60	IC	uPC1377C	
IC306	8-759-105-49	IC	uPC319G2	
IC307	8-759-250-81	IC	TC5081AP	
IC308	8-759-100-96	IC	uPC4558G2	
IC309	8-759-906-28	IC	SN74LS628N	
IC310	8-759-520-61	IC	BU5787K	
IC311	8-759-929-73	IC	SN74LS00NS	
IC312	8-759-929-99	IC	SN74LS32NS	
IC313	8-759-011-65	IC	MC74HC4053F	
IC314	8-759-907-81	IC	SN74LS221NS	
IC315	8-759-011-65	IC	MC74HC4053F	
IC316	8-759-209-69	IC	TC4S11F	
		< COIL >		
L301	1-408-785-21	INDUCTOR CHIP	47uH	
L302	1-408-785-21	INDUCTOR CHIP	47uH	
L303	1-408-785-21	INDUCTOR CHIP	47uH	
L304	1-408-785-21	INDUCTOR CHIP	47uH	
L305	1-408-785-21	INDUCTOR CHIP	47uH	
L306	1-408-781-00	INDUCTOR CHIP	22uH	
L307	1-408-785-21	INDUCTOR CHIP	47uH	
L308	1-408-785-21	INDUCTOR CHIP	47uH	
		< TRANSISTOR >		
Q302	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q303	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q304	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q305	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q306	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q307	8-729-216-22	TRANSISTOR	2SA1162-G	
Q308	8-729-216-22	TRANSISTOR	2SA1162-G	
Q309	8-729-216-22	TRANSISTOR	2SA1162-G	
Q310	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q311	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q312	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q313	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q314	8-729-216-22	TRANSISTOR	2SA1162-G	
Q315	8-729-216-22	TRANSISTOR	2SA1162-G	
Q316	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q317	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q318	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q319	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q320	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q321	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q322	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q323	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q324	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q325	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q326	8-729-216-22	TRANSISTOR	2SA1162-G	
Q327	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q328	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q329	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q330	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q331	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q332	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q333	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q334	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q335	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q336	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q337	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q338	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q339	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q340	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q341	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q342	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q343	8-729-230-49	TRANSISTOR	2SC2712-YG	
		< RESISTOR >		
R310	1-216-121-00	METAL CHIP	1M 5% 1/10W	
R312	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	
R313	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	
R314	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	
R315	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	
R316	1-216-049-00	METAL CHIP	1K 5% 1/10W	
R317	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	
R318	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	
R319	1-216-049-00	METAL CHIP	1K 5% 1/10W	
R320	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	
R321	1-216-025-00	METAL CHIP	100 5% 1/10W	
R322	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	
R323	1-216-037-00	METAL CHIP	330 5% 1/10W	
R324	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	
R325	1-216-049-00	METAL CHIP	1K 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R326	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R328	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R331	1-216-022-00	METAL CHIP	75	5%	1/10W
R334	1-216-022-00	METAL CHIP	75	5%	1/10W
R337	1-216-022-00	METAL CHIP	75	5%	1/10W
R341	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R342	1-216-025-00	METAL CHIP	100	5%	1/10W
R343	1-216-121-00	METAL CHIP	1M	5%	1/10W
R344	1-216-097-00	METAL CHIP	100K	5%	1/10W
R345	1-216-025-00	METAL CHIP	100	5%	1/10W
R346	1-216-041-00	METAL CHIP	470	5%	1/10W
R347	1-216-049-00	METAL CHIP	1K	5%	1/10W
R348	1-216-295-00	METAL CHIP	0	5%	1/10W
R349	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R350	1-216-072-00	METAL CHIP	9.1K	5%	1/10W
R351	1-216-085-00	METAL CHIP	33K	5%	1/10W
R354	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R355	1-216-043-00	METAL CHIP	560	5%	1/10W
R356	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R357	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R358	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R359	1-216-041-00	METAL CHIP	470	5%	1/10W
R360	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R361	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R362	1-216-041-00	METAL CHIP	470	5%	1/10W
R363	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R364	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R365	1-216-049-00	METAL CHIP	1K	5%	1/10W
R366	1-216-041-00	METAL CHIP	470	5%	1/10W
R367	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R368	1-216-049-00	METAL CHIP	1K	5%	1/10W
R369	1-216-049-00	METAL CHIP	1K	5%	1/10W
R370	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R371	1-216-045-00	METAL CHIP	680	5%	1/10W
R372	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R373	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R374	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R375	1-216-045-00	METAL CHIP	680	5%	1/10W
R376	1-216-073-00	METAL CHIP	10K	5%	1/10W
R377	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R378	1-216-049-00	METAL CHIP	1K	5%	1/10W
R379	1-216-748-11	METAL CHIP	39K	1%	1/10W
R380	1-216-077-00	METAL CHIP	15K	5%	1/10W
R381	1-216-073-00	METAL CHIP	10K	5%	1/10W
R382	1-216-095-00	METAL CHIP	82K	5%	1/10W
R383	1-216-073-00	METAL CHIP	10K	5%	1/10W
R384	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R385	1-216-073-00	METAL CHIP	10K	5%	1/10W
R386	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R387	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R388	1-216-045-00	METAL CHIP	680	5%	1/10W
R389	1-216-089-00	METAL CHIP	47K	5%	1/10W
R390	1-216-049-00	METAL CHIP	1K	5%	1/10W
R391	1-216-073-00	METAL CHIP	10K	5%	1/10W
R392	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R393	1-216-073-00	METAL CHIP	10K	5%	1/10W
R394	1-216-049-00	METAL CHIP	1K	5%	1/10W
R395	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R396	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R397	1-216-045-00	METAL CHIP	680	5%	1/10W
R398	1-216-049-00	METAL CHIP	1K	5%	1/10W
R399	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R401	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R402	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R403	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R404	1-216-073-00	METAL CHIP	10K	5%	1/10W
R405	1-216-073-00	METAL CHIP	10K	5%	1/10W
R406	1-216-081-00	METAL CHIP	22K	5%	1/10W
R407	1-216-049-00	METAL CHIP	1K	5%	1/10W
R408	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R409	1-216-049-00	METAL CHIP	1K	5%	1/10W
R411	1-216-039-00	METAL CHIP	390	5%	1/10W
R412	1-216-295-00	METAL CHIP	0	5%	1/10W
R414	1-216-025-00	METAL CHIP	100	5%	1/10W
R415	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R417	1-216-091-00	METAL CHIP	56K	5%	1/10W
R418	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R419	1-216-085-00	METAL CHIP	33K	5%	1/10W
R420	1-216-086-00	METAL GLAZE	36K	5%	1/10W
R421	1-216-095-00	METAL CHIP	82K	5%	1/10W
R422	1-216-085-00	METAL CHIP	33K	5%	1/10W
R423	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R424	1-216-095-00	METAL CHIP	82K	5%	1/10W
R425	1-216-091-00	METAL CHIP	56K	5%	1/10W
R426	1-216-093-00	METAL CHIP	68K	5%	1/10W
R427	1-216-079-00	METAL CHIP	18K	5%	1/10W
R428	1-216-077-00	METAL CHIP	15K	5%	1/10W
R429	1-216-075-00	METAL CHIP	12K	5%	1/10W
R430	1-216-081-00	METAL CHIP	22K	5%	1/10W
R431	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R434	1-216-295-00	METAL CHIP	0	5%	1/10W
R436	1-216-022-00	METAL CHIP	75	5%	1/10W
R437	1-216-037-00	METAL CHIP	330	5%	1/10W
R438	1-216-037-00	METAL CHIP	330	5%	1/10W
R439	1-216-025-00	METAL CHIP	100	5%	1/10W
R440	1-216-045-00	METAL CHIP	680	5%	1/10W

Ref. No.	Part No.	Description			Remark
R441	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R442	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R443	1-216-073-00	METAL CHIP	10K	5%	1/10W
R444	1-216-079-00	METAL CHIP	18K	5%	1/10W
R445	1-216-022-00	METAL CHIP	75	5%	1/10W
R446	1-216-022-00	METAL CHIP	75	5%	1/10W
R447	1-216-037-00	METAL CHIP	330	5%	1/10W
R448	1-216-037-00	METAL CHIP	330	5%	1/10W
R449	1-216-039-00	METAL CHIP	390	5%	1/10W
R450	1-216-039-00	METAL CHIP	390	5%	1/10W
R451	1-216-025-00	METAL CHIP	100	5%	1/10W
R452	1-216-025-00	METAL CHIP	100	5%	1/10W
R453	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R454	1-216-045-00	METAL CHIP	680	5%	1/10W
R455	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R456	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R457	1-216-045-00	METAL CHIP	680	5%	1/10W
R458	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R459	1-216-073-00	METAL CHIP	10K	5%	1/10W
R460	1-216-079-00	METAL CHIP	18K	5%	1/10W
R461	1-216-025-00	METAL CHIP	100	5%	1/10W
R464	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R465	1-216-073-00	METAL CHIP	10K	5%	1/10W
R466	1-216-073-00	METAL CHIP	10K	5%	1/10W
R467	1-216-048-00	METAL CHIP	910	5%	1/10W
R468	1-216-049-00	METAL CHIP	1K	5%	1/10W
R469	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R470	1-216-049-00	METAL CHIP	1K	5%	1/10W
R471	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R472	1-216-077-00	METAL CHIP	15K	5%	1/10W
R473	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R474	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R475	1-216-049-00	METAL CHIP	1K	5%	1/10W
R476	1-216-077-00	METAL CHIP	15K	5%	1/10W
R477	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R478	1-216-025-00	METAL CHIP	100	5%	1/10W
R479	1-216-049-00	METAL CHIP	1K	5%	1/10W
R480	1-216-021-00	METAL CHIP	68	5%	1/10W
R481	1-216-039-00	METAL CHIP	390	5%	1/10W
R482	1-216-033-00	METAL CHIP	220	5%	1/10W
R483	1-216-041-00	METAL CHIP	470	5%	1/10W
R484	1-216-025-00	METAL CHIP	100	5%	1/10W
R487	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R488	1-216-049-00	METAL CHIP	1K	5%	1/10W
R489	1-216-077-00	METAL CHIP	15K	5%	1/10W
R490	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R491	1-216-049-00	METAL CHIP	1K	5%	1/10W
R493	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R494	1-216-065-00	METAL CHIP	4.7K	5%	1/10W

Ref. No.	Part No.	Description			Remark
		< VARIABLE RESISTOR >			
RV302	1-238-089-11	RES, ADJ, CERMET 4.7K			
RV303	1-238-088-11	RES, ADJ, CERMET 2.2K			
RV304	1-238-087-11	RES, ADJ, CERMET 1K			
RV305	1-238-087-11	RES, ADJ, CERMET 1K			
RV307	1-238-091-11	RES, ADJ, CERMET 22K			
RV308	1-238-090-11	RES, ADJ, CERMET 10K			
RV309	1-238-088-11	RES, ADJ, CERMET 2.2K			
RV310	1-238-088-11	RES, ADJ, CERMET 2.2K			
RV311	1-238-088-11	RES, ADJ, CERMET 2.2K			
		< SWITCH >			
SW301	1-570-863-11	SWITCH, SLIDE			
		< THERMISTOR >			
TH302	1-809-558-11	THERMISTOR			
TH303	1-809-559-11	THERMISTOR			
		< CRYSTAL >			
XT302	1-579-388-11	OSCILLATOR, CRYSTAL			
XT303	1-579-387-11	OSCILLATOR, CRYSTAL			
**********					
*	1-636-624-12	EX-26 BOARD			
		**********			
		< CONNECTOR >			
⚠* CN501	1-564-321-11	PIN, CONNECTOR 2P			
⚠* CN502	1-564-321-11	PIN, CONNECTOR 2P			
**********					
*	A-8080-685-A	PU-51 BOARD, COMPLETE			
		**********			
*	1-636-623-13	PU-51 BOARD			
		< BUZZER >			
BZ1	1-529-070-11	BUZZER			
		< CAPACITOR >			
C1	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C2	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C3	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C4	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C5	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C6	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C7	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C8	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C9	1-163-038-00	CERAMIC CHIP	0.1uF		25V

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

Ref. No.	Part No.	Description			Remark
C10	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C11	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C12	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C13	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C14	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C15	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C16	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C17	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C18	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C19	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C20	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C21	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C22	1-126-929-11	ELECT	4700uF	20%	10V
C23	1-126-929-11	ELECT	4700uF	20%	10V
C24	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C25	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C26	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C27	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C28	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C29	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C30	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C31	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C32	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C34	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C35	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C36	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C41	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C42	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C43	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C45	1-163-109-00	CERAMIC CHIP	47PF	5%	50V

< CONNECTOR >

* CN1	1-564-705-11	PIN, CONNECTOR (SMALL TYPE)	3P
* CN2	1-564-509-11	PLUG, CONNECTOR	6P
* CN6	1-564-710-11	PIN, CONNECTOR (SMALL TYPE)	8P
* CN7	1-564-711-11	PIN, CONNECTOR (SMALL TYPE)	9P
* CN8	1-564-712-11	PIN, CONNECTOR (SMALL TYPE)	10P

< FERRITE BEADS >

FB1	1-412-390-21	INDUCTOR CHIP	0uH
FB2	1-412-390-21	INDUCTOR CHIP	0uH
FB3	1-412-390-21	INDUCTOR CHIP	0uH
FB4	1-412-390-21	INDUCTOR CHIP	0uH
FB5	1-412-390-21	INDUCTOR CHIP	0uH
FB6	1-412-390-21	INDUCTOR CHIP	0uH
FB7	1-412-390-21	INDUCTOR CHIP	0uH
FB8	1-412-390-21	INDUCTOR CHIP	0uH
FB9	1-412-390-21	INDUCTOR CHIP	0uH
FB10	1-412-390-21	INDUCTOR CHIP	0uH
FB11	1-412-390-21	INDUCTOR CHIP	0uH
FB12	1-412-390-21	INDUCTOR CHIP	0uH

< IC >

IC1	8-759-916-80	IC	LH0080A
IC2	8-759-635-83	IC	M51957BFP
IC4	8-759-060-89	IC	LH534HSS
IC5	8-759-517-51	IC	TMS4464-10FML
IC6	8-759-517-51	IC	TMS4464-10FML
IC7	8-759-506-54	IC	MB620468
IC8	8-759-922-51	IC	V9938
IC9	8-759-517-51	IC	TMS4464-10FML
IC10	8-759-517-51	IC	TMS4464-10FML
IC11	8-759-517-51	IC	TMS4464-10FML
IC12	8-759-517-51	IC	TMS4464-10FML
IC13	8-759-929-73	IC	SN74LS00NS
IC14	8-759-245-58	IC	TC35095AF
IC16	8-759-930-48	IC	SN74LS156NS

< COIL >

L2	1-412-031-11	INDUCTOR CHIP	47uH

< TRANSISTOR >

Q1	8-729-901-06	TRANSISTOR	DTA144EK
Q2	8-729-901-06	TRANSISTOR	DTA144EK
Q3	8-729-901-06	TRANSISTOR	DTA144EK
Q4	8-729-901-06	TRANSISTOR	DTA144EK
Q5	8-729-901-01	TRANSISTOR	DTC144EK
Q6	8-729-901-06	TRANSISTOR	DTA144EK
Q7	8-729-901-06	TRANSISTOR	DTA144EK
Q8	8-729-903-30	TRANSISTOR	DTC144TK
Q9	8-729-901-06	TRANSISTOR	DTA144EK

< RESISTOR >

R1	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R2	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R3	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R4	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R5	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R6	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R7	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R8	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R9	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R10	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R11	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R12	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R13	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R14	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R15	1-216-065-00	METAL CHIP	4.7K	5%	1/10W

PU-51 SW-48 SW-54

Ref. No.	Part No.	Description			Remark
R16	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R17	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R18	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R19	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R20	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R21	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R22	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R23	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R24	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R25	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R26	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R27	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R28	1-216-049-00	METAL CHIP	1K	5%	1/10W
R29	1-216-121-00	METAL CHIP	1M	5%	1/10W
R31	1-216-025-00	METAL CHIP	100	5%	1/10W
R32	1-216-025-00	METAL CHIP	100	5%	1/10W
R33	1-216-025-00	METAL CHIP	100	5%	1/10W
R34	1-216-025-00	METAL CHIP	100	5%	1/10W
R35	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R36	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R37	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R38	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R39	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R40	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R42	1-216-115-00	METAL CHIP	560K	5%	1/10W
R43	1-216-103-00	METAL CHIP	180K	5%	1/10W
R44	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R45	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R46	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R47	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R48	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R49	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R50	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R51	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R52	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R53	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R54	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R55	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R56	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R57	1-216-033-00	METAL CHIP	220	5%	1/10W
R58	1-216-049-00	METAL CHIP	1K	5%	1/10W
R59	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R60	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R61	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R62	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R63	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R64	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R65	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R66	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R67	1-216-295-00	METAL CHIP	0	5%	1/10W
R68	1-216-013-00	METAL CHIP	33	5%	1/10W
R70	1-216-049-00	METAL CHIP	1K	5%	1/10W
R72	1-216-013-00	METAL CHIP	33	5%	1/10W

< VIBRATOR >

X1 1-567-881-11 VIBRATOR, CRYSTAL (16MHz)

****

* A-8080-684-A SW-48 BOARD, COMPLETE
****

* 1-636-625-12 SW-48 BOARD

< CONNECTOR >

CN102 1-580-318-11 SOCKET, CONNECTOR 10P

< DIODE >

D101 8-719-950-41 DIODE GL-3EG43 (POWER)

< SWITCH >

S101 1-554-303-21 SWITCH, TACTILE (CLEAR)
S102 1-552-539-00 SWITCH, TACTILE (DRAW/WIPE IN)

****

* A-8080-683-A SW-54 BOARD, COMPLETE
****

* 1-636-626-12 SW-54 BOARD

< DIODE >

D201 8-719-987-73 DIODE GL-3HD43 (□)
D202 8-719-987-73 DIODE GL-3HD43 (↑)
D203 8-719-987-73 DIODE GL-3HD43 (■)
D204 8-719-987-73 DIODE GL-3HD43 (↓)
D205 8-719-987-73 DIODE GL-3HD43 (SUPERIMPOSE)

D206 8-719-987-73 DIODE GL-3HD43 (MODE DRAW)
D207 8-719-987-73 DIODE GL-3HD43 (MODE STANDBY)
D208 8-719-987-73 DIODE GL-3HD43 (PAGE 1)
D209 8-719-987-73 DIODE GL-3HD43 (PAGE 2)

< SWITCH >

S201 1-554-303-21 SWITCH, TACTILE (□)
S202 1-554-303-21 SWITCH, TACTILE (↑)
S203 1-554-303-21 SWITCH, TACTILE (■)
S204 1-554-303-21 SWITCH, TACTILE (↓)
S205 1-554-303-21 SWITCH, TACTILE (SUPERIMPOSE)

S206 1-554-303-21 SWITCH, TACTILE (MODE)
S207 1-554-303-21 SWITCH, TACTILE (SELECT)
S208 1-552-539-00 SWITCH, TACTILE (DRAW/WIPE OUT)

Ref. No.	Part No.	Description	Remark
*	1-636-914-11	SW-55 BOARD	
		**********	
		< SWITCH >	
⚠SW601	1-554-011-21	SWITCH, SEESAW (AC POWER)	
		**********	
		MISCELLANEOUS	
		**********	
⚠16	1-413-660-11	REGULATOR, SWITCHING	
⚠20	1-575-105-11	CORD, POWER	
		**********	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	X-4620-176-1	PEN ASSY	
	1-690-088-11	CORD, CONNECTION (Pin-Pin)	
	3-752-636-23	MANUAL, INSTRUCTION (ENGLISH)	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT	
*	4-620-664-02	CUSHION (UPPER)	
*	4-620-665-02	CUSHION (LOWER)	
	4-620-776-21	MANUAL, INSTANT INFORMATION (ENGLISH)	
	4-260-776-31	MANUAL, INSTANT INFORMATION	
*	4-621-920-01	INDIVIDUAL CARTON (US)	
*	4-623-484-01	INDIVIDUAL CARTON (Canadian)	
*	7-632-650-73	SHEET, PROTECTION (500MM)	
		**********	
		HARDWARE LIST	
		**********	
#1	7-682-548-09	SCREW +P 3X8	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#3	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
		**********	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Note: Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le neméro spécifié.

SECTION 7
OPERATING PRINCIPLE DESCRIPTION

• TABLET (PAD) OPERATING PRINCIPLE AND TROUBLESHOOTING PROCEDURE

The tablet used on this set is the device made up of two films of resistance installed parallel at the distance not to contact each other. (Fig. 1)

There are plastic particles between two films at regular intervals and they are hard to contact each other because of this construction. (Fig. 2a)

When pushing the surface of tablet with the attached pen or equivalent, the film is bent and conducts electricity. (Fig. 2b)

The equivalent circuit of tablet is as shown in Fig. 3a, when pushing a point, it goes to as shown in Fig. 3b. At this time, connect as shown in Fig. 4a and by checking the voltage on point A, X coordinate is found. Connect as shown in Fig. 4b, and by checking the voltage on point B, Y coordinate is found.

In actually circuit, using transistors and analog switches (within A/D converter), it is switched to Fig. 4a or Fig. 4b at high speed, checks the pushed coordinate.

In troubles of tablet, the silver pattern or the film of resistance cutting off is common case. It can be checked with a tester. Remove the connector from the upper cabinet, and contact the tester to the land of CN602. At this time, tablet is pushed, the resistance value changes. Be careful not to touch tablet. Besides, in case of the silver pattern is already cut off, but it contacts by bending condition. In such a case, be sure to check by pushing the flexible portion while observing the tester.

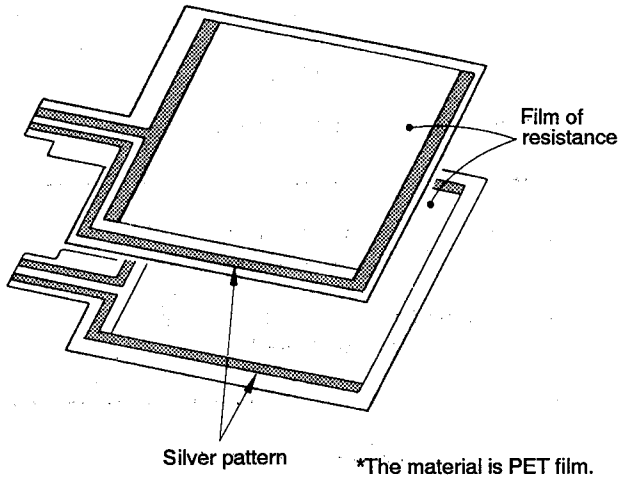


Fig. 1

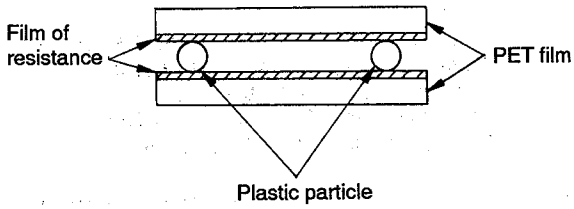


Fig. 2a

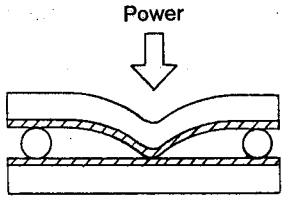


Fig. 2b

Table 1. Relations between Pin No. of CN602 and Resistance Value.

	1	3	6	8	10
1	–	A	×	×	×
3	A	–	×	×	×
6	×	×	–	A	A
8	×	×	A	–	A
10	×	×	A	A	–

← Pin No.

↑ Pin No.

– = 0 Ω
A = 300 – 3,000 Ω
× = Infinity

*Pins not mentioned in table are all connected to ground.

*CN602 is connected to the pad.

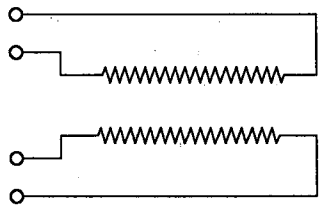


Fig. 3a

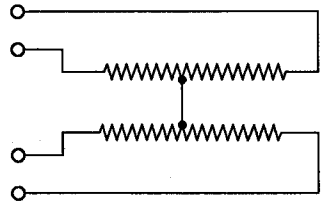


Fig. 3b

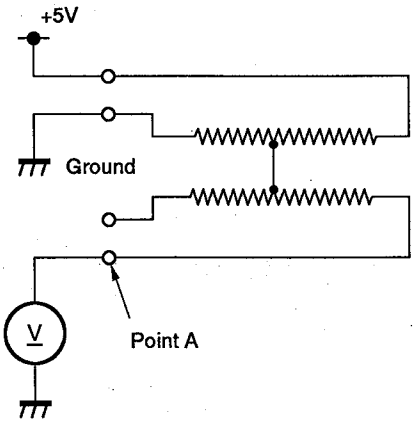


Fig. 4a

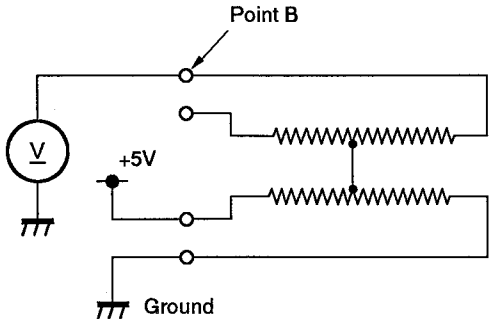


Fig. 4a

SECTION 8
ELECTRICAL ADJUSTMENTS

In the electrical adjustments the following measuring equipments are required.

[Equipments Required]

1) Monitor TV
2) Oscilloscope: 2 phenomena, Band width more than 15 MHz, with delay mode. (Use 10:1 probe unless otherwise specified.)
3) Frequency counter
4) Pattern generator (With S terminal or Y/C terminals)
5) Vectorscope
6) Digital voltmeter

[Setting]

Adjust in the following setting unless otherwise specified.

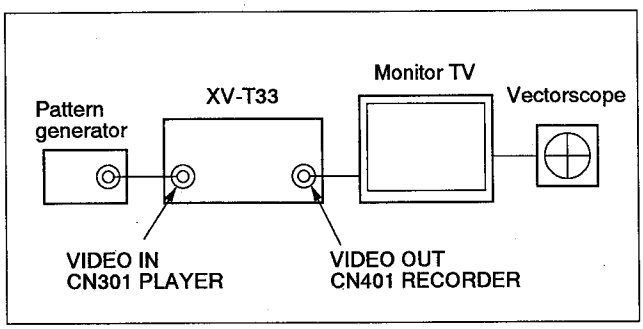


Fig. 8-1.

[Setup for Adjustment]

In adjustments, the video signal fed with the NTSC color-bar pattarn generator is used as the signal for adjustment. Therefore, It is necessory that this video signal satisfies the specified value.

1. Using the composite video signal.
   Connect an oscilloscope to the video input terminal, and check the horizontal sync. signal width becomes approx. 0.3 V, the width of video portion 0.7 V, the width of the burst signal approx. 0.3 V and flat.
   See Fig. 8-2.

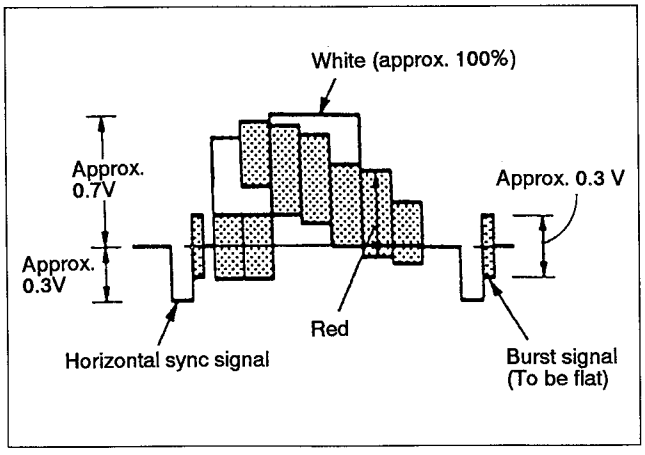


Fig. 8-2.

2. Using S video signal.
   Connect an oscilloscope to Y signal terminal of S video input terminal and check the horizontal sync. signal width of Y signal becomes approx. 0.3 V, width of video portion approx. 0.7 V. And olso connecto an oscilloscope to chroma signal terminal of S video input terminal and check the burst signal width of chroma signal becomes approx. 0.3 V.
   See Fig. 8-3.

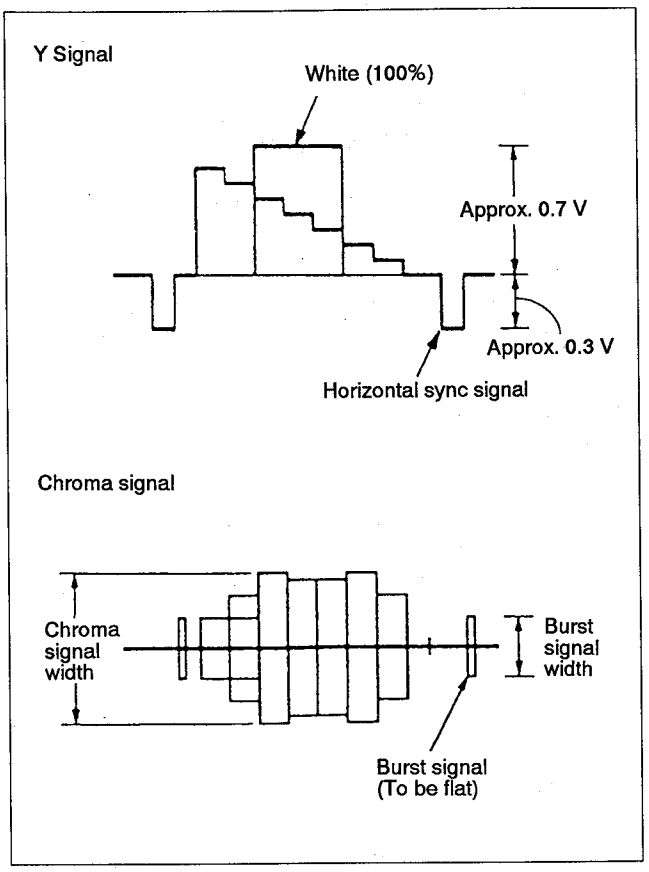


Fig. 8-3.

Note: When turing power on, the set starts demonstrating. At this time touching somewhere on the pad with the assorted pen, the set goes to the condition waiting for the input. The following electrical adjustments are performed in its condition.

8-1. SG CLOCK ADJUSTMENT

Mode	E-E
Signal	No signal
Measuring point	TP303
Measuring equipment	Frequency counter
Adjusting element	CV301
Specified value	3,579,545 ± 10 Hz

8-2. AFC FREQUENCY ADJUSTMENT

Mode	E-E
Signal	No signal
Connection	Connect TP322 to Ground
Measuring point	TP307
Measuring equipment	Frequency counter
Adjusting element	RV302
Specified value	15,750 ± 10 Hz

When TP322 is connected to ground, the set goes to the freerun condition, the monitor screen goes out of order.

8-3. VDP (VIDEO DISPLAY PROCESSOR) ADJUSTMENT

Mode	E-E
Signal	No signal
VCO HI-FREQ. adjustment	
Connection	SW301: Open
Measuring point	TP309
Measuring equipment	Frequency counter
Adjusting element	RV305
Specified value	22.4 ± 0.1 MHz
VCO LO-FREQ. adjustment	
Connection	Connect TP321 to ground
Measuring point	TP309
Measuring equipment	Frequency counter
Adjusting element	RV304
Specified value	20.4 ± 0.1 MHz

[Procedure]

1) Position SW301 to OPEN. At this time the screen goes out of order.
2) Adjust with RV305 so that the VCO oscillating freguency on TP309 becomes 22.4 ± 0.1 MHz.
3) Position SW301 to ground.
4) Connect TP321 to ground with a jumper wire.
5) Adjust with RV304 so taht the VCO oscillating frequency on TP309 becomes 20.4 ± 0.1 MHz.
6) Remove a jumper wire between TP321 and ground.
7) Repeat items 1) to 6) so that both the specified value should be satisfied.
8) Confirm the SW301 turns to ground and a jumper wire has already removed.

8-4. AFC H POSITION ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	CH1: TP305 (VIDEO) CH2: TP308 (H. POS)
Measuring equipment	Oscilloscope
Adjusting element	RV308
Specified value	d=0.0 ± 0.3 μsec

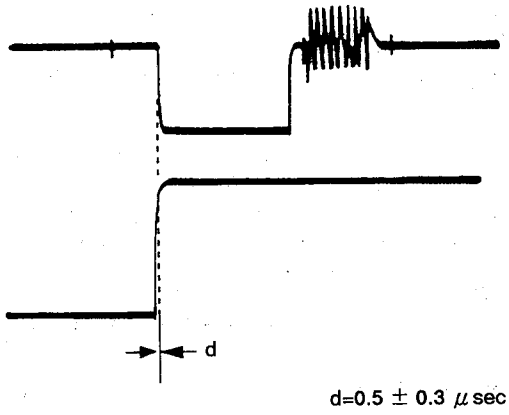


Fig. 8-4.

8-5. BLK POSITION ADJUSTMENT

Mode	E-E
Signal	Color-ber
Measuring point	CH1: TP305 (VIDEO) CH2: TP318 (BLK)
Measuring equipment	Oscilloscope
Adjusting element	RV307
Specified ealue	d=2.0 ± 0.3 μsec

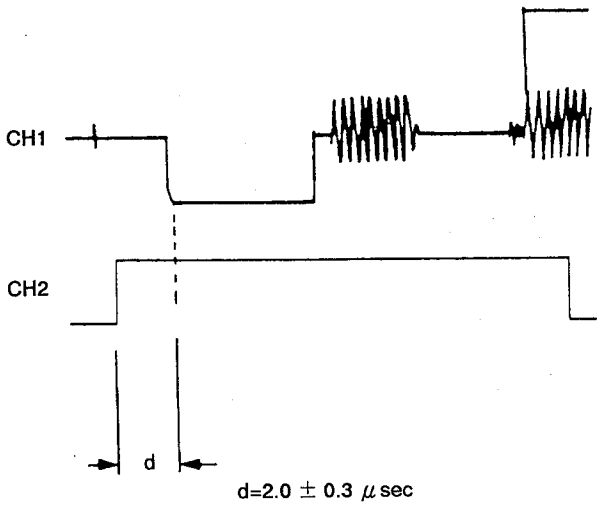


Fig. 7-5.

8-6. V RESET ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	CH1: TP305 (VIDEO) CH2: TP312
Measuring equipment	Oscilloscope
Adjusting element	RV303
Specified value	d=8 ± 1 μsec

Note: Trigger sets on CH2.

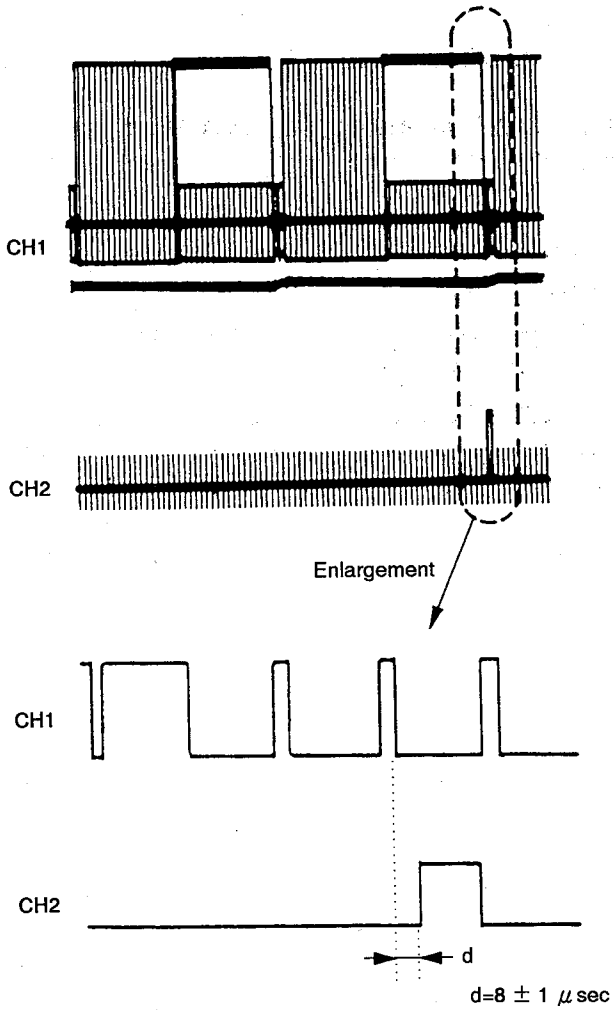


Fig. 8-6.

8-7. VIDEO OUTPUT LEVEL ADJUSTMENT

Mode	E-E
Signal	Color-bar (VIDEO INPUT)
Measuring point	TP315
Measuring equipment	Oscilloscope
Adjusting element	RV309
Specified value	1.0 ± 0.1 Vp-p

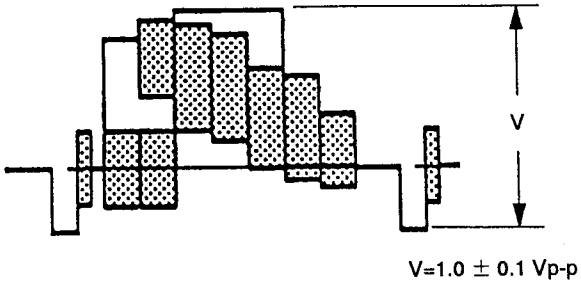


Fig. 8-7.

8-8. APC (AUTOMATIC PHASE CONTROL) ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	VIDEO OUT terminal (75 Ω terminated)
Measuring equipment	Vectorscope
Adjusting element	CV303
Specified value	Match the color-bar phases of the input signal and the internal signal at the cyan (Cy) as the center.

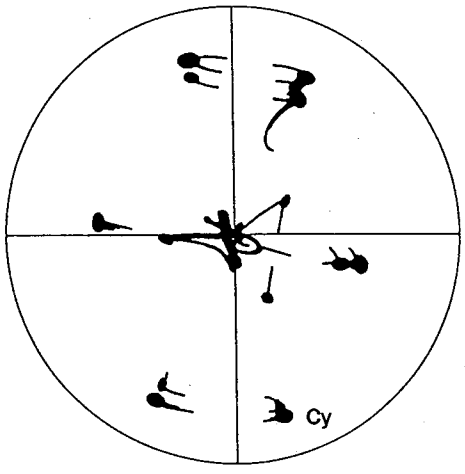


Fig. 8-8.

8-9. S VIDEO LEVEL ADJUSTMENT

8-9-1. Y Level Adjustment

Mode	E-E
Signal	Color-bar (S VIDEO INPUT)
Measuring point	CH1: TP317 CH2: TP316
Measuring equipment	Oscilloscope
Adjusting element	RV311
Specified value	1.0 ± 0.1 Vp-p

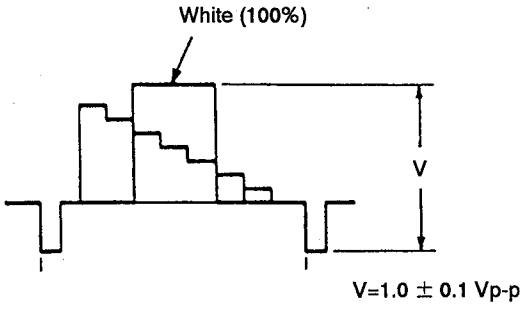


Fig. 8-9.

8-9-2. Chroma Level Adjustment

Mode	E-E
Signal	Color-bar (S VIDEO INPUT)
Measuring point	CH1: TP317 CH2: TP316
Measuring equipment	Oscilloscope
Adjusting element	RV310
Specified value	0.6 ± 0.06 V

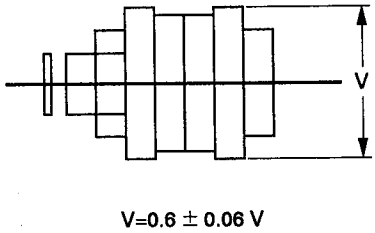
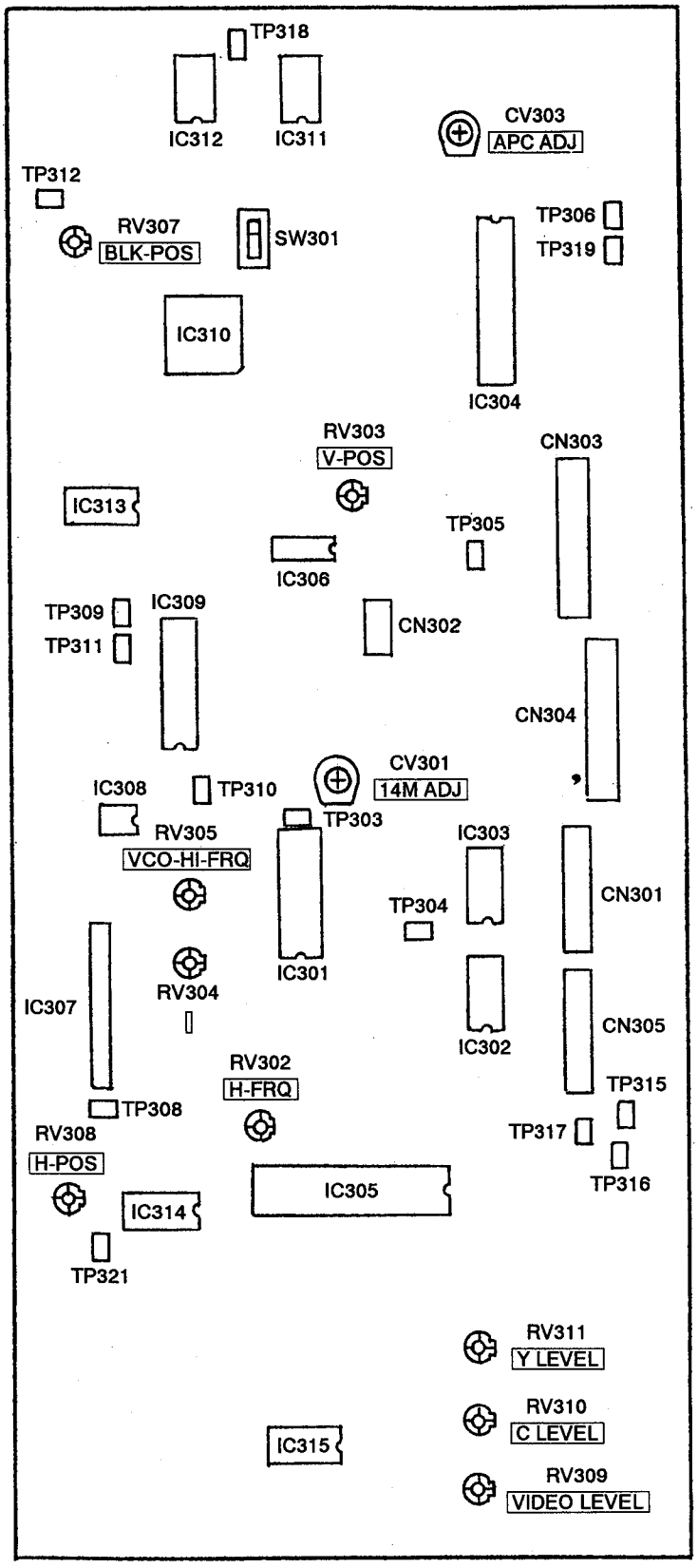


Fig. 8-10.

8-10. ADJUSTING PARTS LOCATION

EN-5 BOARD *– Component Side –*



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